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Crowdsourced market research and survey completion using intelligent conversational assistants

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ABSTRACT

Insights into customer behavior are important for making business decisions. Yet current market research methods, e.g., surveys, multiple-choice questionnaires, etc., are long or complex, and have little or no incentive for customer participation. The quality and coverage of data that results from traditional surveys is sometimes found to be insufficient.

This disclosure leverages conversational assistants to conduct market research. At appropriate times, and with user permission, a conversational assistant asks a user questions relating to their everyday purchases, behaviors, or preferences. The questions may be longitudinal, audio-based, location-based, etc. For users that provide permission, user responses can be studied, without use of user-specific identifiers, via statistical techniques for qualitative responses, e.g., word clouds, common themes, sentiment analysis, etc. Per the techniques, qualitative questions that heretofore could only be assessed in small settings such as focus groups can be conducted at the scale of quantitative market research.

KEYWORDS

Market research; longitudinal survey; survey completion; crowdsourcing; smart speaker; conversational assistant; smart assistant; virtual assistant; word cloud; sentiment analysis; task completion

BACKGROUND

Human insights are often important for making business decisions. Yet current market research methods are long or complex, and often lead to poor quality data. Some examples of traditional methods to capture user insights include: hotels sending email surveys after a stay;

retail stores including feedback surveys at the bottom of paper receipts after a purchase; data insight researchers sending multiple choice surveys in the mail; etc. The completion rate on such surveys can be low because of little or no incentive for participation. Some market research methods, such as the use of data insight researchers or focus groups, are expensive to conduct and to scale.

DESCRIPTION

This disclosure enables a conversational software assistant to collect fast, reliable, crowdsourced opinions for task completion through natural, conversational dialog. Per the techniques of this disclosure, smart voice platforms ask conversational questions ("Welcome home. How was your stay at the resort?") with user permission and at appropriate times of the day. The conversational question is a question that is formed to elicit a long-form qualitative response, rather than a quantitative yes or no response. Users can provide long-form answers by simply speaking them out. With user permission, responses, if any, are obtained with user-specific identifiers, anonymized, collated, and studied via statistical techniques for qualitative responses, e.g., word clouds, common themes, sentiment analysis, etc.

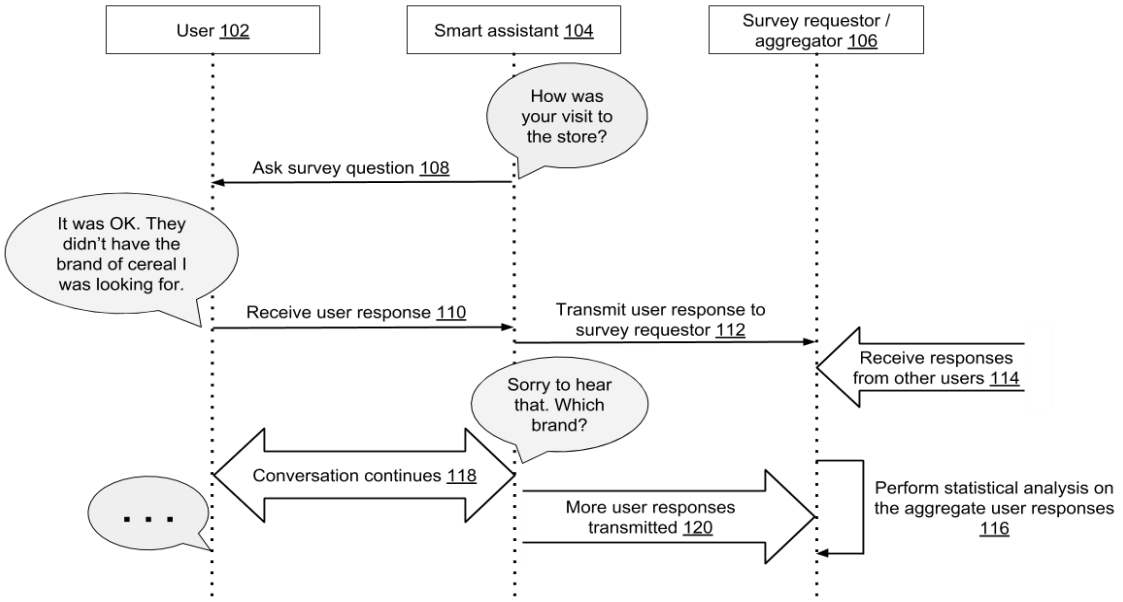

Fig. 1: Survey completion using a conversational assistant

Fig. 1 illustrates an example sequence of operations for survey completion using a conversational assistant, per techniques of this disclosure. With user permission, a smart assistant (104) asks a survey question (108) to a user (102). The smart assistant can be surfaced in a variety of ways, e.g., an eyes-free smart speaker that only accepts spoken input; a smart display screen for visual representation that accepts spoken, touch, or typed input; a mobile device that accepts voice or typed input and has a display screen; etc. The survey question or task is presented in a conversational manner, and includes text, images, audio, or video as needed. An advantage of offering tasks through the conversational assistant is the opportunity to collect conversational dialog when completing a task, which is significantly more natural and representative than typing a short snippet or answering a multiple choice question in a survey.

Types of tasks or surveys that could be offered by the conversational assistant include, for example:

- Longitudinal surveys, e.g., questions that span user behavior across time. Examples of such types of questions are “what did you eat today?”, “what did you watch today?”,

"what brands did you use today?", etc. Longitudinal surveys are very valuable to businesses, but in their traditional mode of collection, e.g., getting users to log in to a website or app on a daily basis to give feedback, respondents are found to drop off before the survey period completion. The smart assistant, voice-platform mode of longitudinal surveys, per techniques of this disclosure, makes it possible to have conversation-style surveys daily, reduces friction, and increases the likelihood of respondents completing the survey.

- Audio-based surveys, e.g., "how does this song make you feel?", "during which Super Bowl advertisement do you remember hearing this song?", etc. Again, the conversational assistant technique of conducting audio-based surveys allows the user to listen to the audio in a more natural and frictionless way, such as through a speaker in their kitchen or living room. This ease of access is more likely to engage respondents than current techniques that obtain written responses from the user via a desktop application, website or app.
- Location-based surveys, e.g., "how was your visit to our store?", "what were you looking for?", "did you find what you needed?", etc. Location-based surveys are based on current or recent location history, where user location history information is used with permission. Location-based surveys are provided at times that are appropriate for the user, e.g., while in the store, just after they have returned from a store, at the end of the day, while driving back, etc.

The user response, if any, is received by the conversational assistant (110). The user responds simply by speaking, e.g., in a free-form manner. With user permission, the conversational assistant transmits user response (112) to the survey requestor or aggregator (106). The survey

requestor continually receives responses to survey questions from various respondents (114). The survey requestor performs statistical analysis on the received responses. The statistical techniques employed are appropriate to the qualitative nature of the responses, e.g., word clouds, commonly spoken words or answers, tagging, sentiment analysis, theme-finding, trends or pattern detection, etc. Machine learning can be applied to analyze the survey responses.

The conversation between the smart assistant and the user continues (118), as does transmittal of responses to the survey aggregator (120).

The techniques of this disclosure bring qualitative research to the scale of quantitative research. Qualitative research, which heretofore was possible only in small settings, e.g., focus groups, one-on-one conversations, etc., can now be conducted over much larger populations. The techniques mimic a focus group, except at very large scale.

The techniques connect task or survey requestors, e.g., researchers, enterprises, brands, or any individual, with a representative sample of willing respondents. The connection between survey requestors and respondents can be made, e.g., on a web platform or mobile app. The conversational assistant can incentivize users to respond to survey questions by providing rewards for responses in aggregate. For example, a single store, e.g., online store, can provide a credit for each survey response submitted. Alternatively, or in addition, incentives relevant to the task can be provided, e.g., a coupon or discount to a store visited by the user.

Machine learning models are bootstrapped and trained with a large amount of previously obtained data. Such data collection is often a manual process. An additional benefit of the assistant-respondent conversations, per techniques of this disclosure, is the generation of a large corpus of speech utterances, which, if permitted by the respondents, can be used to train and test speech recognition models. Similarly, large numbers of image samples with tagged metadata are

used to train and test image recognition models. Collecting such large numbers of data samples is traditionally expensive and time consuming and can be done inexpensively per the techniques herein.

The growing adoption of conversational assistants provided as hardware, e.g., smart speakers, home appliances, etc., or software, e.g., on a smartphone, wearable device, etc. offers a fast, reliable, crowdsourced, and naturally conversational medium for businesses or brands to conduct market research, and for customers or respondents to complete tasks such as surveys or data annotation.

Further to the descriptions above, a user may be provided with controls allowing the user to make an election as to both if and when systems, programs or features described herein may enable collection of user information (e.g., information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), and if the user is sent content or communications from a server. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over what information is collected about the user, how that information is used, and what information is provided to the user.

CONCLUSION

This disclosure leverages conversational assistants to conduct market research or other data collection tasks. At appropriate times, and with user permission, a conversational assistant asks a user various questions, such as relating to their everyday purchases or behaviors. The

questions may be longitudinal, audio-based, location-based, etc. With user permission, responses are collated and studied via statistical techniques for qualitative responses, e.g., word clouds, common themes, sentiment analysis, etc. Per the techniques, qualitative questions that heretofore could only be assessed in small settings like focus groups are conducted at the scale of quantitative market research.